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selectively movable to vary the relative positions of the first and second bearing surfaces to thereby apply forces to the wear member and the boss that tend to tighten the mounting of the wear member on the boss.

116. (Amended) A wear assembly in accordance with claim 115 wherein the boss includes a front structure that wraps around the digging edge of the lip.

REMARKS

The Office Action of November 21, 2001 has been received and considered. Claims 74, 75, 77, 78, 80, 81, 88, 91, 92, 94, 100, 103, and 114-116 have been amended. Claims 1-73 have been allowed. Claims 74-118 remain pending and under rejection. Reconsideration of these claims is requested.

Applicants acknowledge the need to submit either the original patent or a declaration as to its loss or inaccessibility before this application can be reissued. Applicants request that this requirement be held in abeyance until all the claims have been allowed.

Claims 74-118 have been rejected under 35 U.S.C. 251 as recapturing subject matter that was surrendered in the original application for patent. Applicants do not believe any of these claims seek to recapture surrendered claims, and thus, ask for reconsideration of this rejection.

First, the examiner asserts that the recitation of a "T-shaped structure" in the claims constitutes an improper recapture of surrendered subject matter. However, the term "T-shaped structure" is not used in any of claims 74-118.

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Accordingly, none of claims 74-118 can be improper on the basis of seeking to recapture this limitation.

Applicants note that claims 79, 80, 95 and 96 each recite a "T-shaped coupling structure" for the T-shaped formation of the boss that is received into the T-shaped slot of the wear member. However, this structure is referred to as a "T-shaped coupling structure" in the originally issued claim 34. This term was not amended to a more specific limitation in the originally issued patent. Applicants submit that the inclusion of a term that was used in the originally issued claims and was not amended to a more specific form does not constitute recapture of surrendered subject matter. There was simply no surrender of this term in the originally issued claims.

Second, the recitation of an "adjustment assembly selectively movable to vary the relative positions of the first and second faces to eliminate looseness which may exist in mounting said wear member" has also been rejected as recapturing surrendered subject matter. In the prosecution of the original patent, claim 1 was amended so that "an adjustment assembly selectively movable to eliminate looseness" was changed to "an adjustment assembly selectively movable to vary the relative positions of the first and second faces to eliminate looseness." However, none of claims 74-118 return to the originally filed language of claim 1. Claims 88 and 100 recite: "an adjustment assembly that moves the first and second faces relative to each other to tighten the fit of the lock." Similarly, claims 104 and 115 recite: "an adjustment assembly selectively movable to vary

the relative positions of the first and second bearing surface to eliminate looseness."

As can be appreciated, none of these new limitations recite the originally filed language of simply reciting "an adjustment assembly selectively movable to eliminate looseness" without a reference to the relative movement of the two faces. Each of the new claims calls for the relative movement of the two faces in essentially the same way as claim 1 was issued in the original claim. Indeed, claims 104 and 115 are the same as the noted language issuing in claim 1 of the original patent except for referring to the faces as "bearing surfaces." Since none of the claims seek to recite the originally recited limitation that was amended during the prosecution of the original patent, there can be no attempted recapture of surrendered subject matter.

Applicants submit that none of the new claims 74-118 include limitations from the originally filed applications that were subsequently narrowed during the prosecution of original patent. Moreover, claims 74-78, 81-94, 97-99, 103 and 107-114 do not even include either of the recitations asserted to constitute recaptured subject matter. Hence, withdrawal of this rejection is respectfully requested.

The examiner has also objected to the new claims as introducing new matter into the disclosure.

First, the examiner objects to the inclusion of the limitation "mount" in claims 74, 91, 114, and 115. Applicants do not believe this constitutes new matter. The

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mount pertains to the boss that mounts the wear member to the lip. Applicants do not believe the use of the word "mount" in this instance constitutes new matter. Further, the word "mount" is used in already allowed claim 62 without objection. In any event, since there the terms "boss" and "mount" are equally broad terms, applicants have amended claims 74, 75, 77, 78, 80, 81, 88, 91, 92, 94, 100 and 114-116 to change "mount" to "boss" so as to avoid further unnecessary arguments over the issue and expedite allowance of this application.

Claims 103 and 111 have been objected to on the basis that the recitation of a "one-piece boss" constitutes new matter. Applicants do not agree with this objection. The term "boss" is clearly used in the originally filed application to describe the member 24 that secures the wear member to the lip. Although the word "boss" does not itself indicate a one-piece member, the boss is clearly illustrated as a one-piece member in Figures 4-7. Further, those of ordinary skill in the art would know that these kinds of components are typically made by a casting process, which would produce one-piece components. Finally, the original application expressly states that the boss can be "integrally cast with the lip construction" (col. 4, line 10 of the originally issued patent). The casting of the boss as an integral part of the lip would mean that the lip was a one-piece member. Hence, applicants submit that the recitation of a "one-piece boss" does not constitute new matter.

The examiner also objected to the recitation of a "coupling slot" in claim 103 as being new matter. The "coupling slot" in this claim is the longitudinal slot 62

that receives the upstanding tongue of the boss. Some of the originally filed claims recite this structure as a “T-shaped coupling structure” (see, for example, originally filed claim 10). Further, claim 16, for example, recites that the T-shaped coupling structure is a T-shaped slot. Hence, applicants do not believe that the recitation of a “coupling slot” constitutes new matter. Nevertheless, since the term “slot” is broader than “coupling slot,” applicants have changed claim 103 to simply recite that the structure is a slot so as to avoid further arguments and expedite allowance of the application.

The present invention pertains to a wear assembly for the digging edge of an excavator. Wear members (e.g., teeth and shrouds) attached along the digging edge of an excavator are placed under heavy loads as they are forced through the ground. As a result, the wear member must be securely and stably mounted to the digging edge to prevent their loss. The loss of a wear member not only exposes the underlying structures to premature wearing and loss, but also subjects other processing equipment to potential damage caused by the loose wear member in the excavated material. Additionally, since digging is a very abrasive operation, the wear members must also be able to be easily removed and replaced.

The present wear member is mechanically attached to the digging edge, as opposed to welding, in order to facilitate easy removal and replacement in the field. Nevertheless, the unique attachment has sufficient strength and stability to withstand the large and varied forces encountered during digging, even when used to support digging members such as points. Further, the attachment requires no

special holes to be formed in the digging edge, and thus avoids weakening of the excavator lip.

Claims 74-87, 91-99, 103, and 107-144 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,088,214 to Jones. However, these claims recite a number of features that are not disclosed in the '214 patent.

Independent claim 74 is directed to a wear assembly that includes boss including a front structure with an inner surface that is bent and fixed along a face of the lip and the front of the digging edge. By engaging the front of the digging edge a greater resistance to the applied loads can be achieved. The assembly in the '214 patent includes a boss with a front structure that has an inner surface that is fixed along a face of the lip. However, the inner surface of the boss is neither bent nor fixed along the front of the digging edge are expressly recited in the claim. Accordingly, this claim is not anticipated by the '214 patent.

The dependent claims 75-87 are allowable over the '214 patent for the same reasons as claim 74, but also recite other features not disclosed in the '214 patent.

Claim 75 recites that the boss further includes a front support surface that abuts the wear member to restrict rearward movement of the wear member. As seen clearly in Figure 2 of the '214 patent, the front of the boss does not abut the wear member. Rather, the wear member includes a recess so that such abutment does not occur.

Claim 76 recites that the front support surface noted in claim 75 is arcuate in shape. As noted above, the '214 patent does not even include the front support surface, much less a front surface that is arcuate in shape.

Claim 81 recites that the front structure of the boss wraps around the digging to define a second leg. As noted above, the boss in the '214 patent is a linear member that is not in any way wrapped about the digging edge or including a second leg.

Claim 83 recites that the wear member includes a forwardly extending working portion that is a nose for holding an excavating point. The '214 patent is for mounting shrouds, i.e., wear members that fit over the lip between the excavating teeth. The shrouds do not include forwardly extending noses to mount excavating teeth. Excavating teeth extend farther forward than shrouds, penetrate and break up the ground, and experience much higher loads and stresses than shrouds.

Claim 87 requires that the opening in the wear member for receiving the lock includes a main portion and a stem portion wherein the stem portion is narrower than the main portion and opens in the rear surface of the wear member. Clearly, the opening 39 in the wear member of the '214 patent is spaced from the rear wall. The opening 39 does not open in the rear wall of the wear member.

Independent claim 91 is directed to a wear assembly that includes a boss that includes a front portion that wraps around the digging edge. As discussed above, this front portion of the boss 29 in the '214 patent is spaced from the

digging edge of the lip (see, e.g., Figures 1, 2 and 10), and does not wrap around the digging edge as expressly recited in the claim.

The dependent claims 92-99 are allowable over the '214 patent for this same reason or claim 91.

Independent claim 103 is also directed to a wear assembly that includes a boss having a front portion that wraps around the digging edge. As discussed above, the boss 29 of the '214 patent simply does not wrap around the digging edge. Claim 103 further recites that the front portion forms a forwardly-facing bearing surface. Hence, not only does the boss of the '214 patent not wrap around the digging edge, it also, as discussed above, does not form a forwardly facing bearing surface. The front face of the boss in the '214 patent does not contact the wear member. As clearly seen in Figure 2, the wear member includes a recess about the front surface so that contact does not occur with the front face of the boss. In this same context, claim 103 additionally recites that the wear member includes an abutting surface to engage the forwardly facing bearing face of the boss to limit rearward movement of the wear member relative to the boss. This engagement and interaction between the boss and the wear member in the '214 patent does not occur.

The dependent claim 107 is allowable for this same reason, and also because it additionally recites that the opening receiving the lock includes a main portion and a stem portion wherein the stem portion is narrower than the main

portion and opens in the rear wall of the wear member. As discussed above, the opening 39 in the wear member of the '214 patent does not open in the rear wall.

In the same way, claim 108 is directed to a wear member having an opening for the lock that includes a main portion and a stem portion wherein the stem portion is narrower than the main portion and opens in the rear wall of the wear member. There is no such disclosure in the '214 patent. The opening 39 in the '214 patent is closed on its rear side and does not open in the rear wall of the wear member.

Dependent claims 109-110 are allowable for the same reasons as claim 108. Moreover, claim 109 further recites that the wear member includes a rearwardly facing bearing surface generally between the front working portion and the leg for abutting the boss. As discussed above, the wear member of the '214 patent does not include a rearwardly facing bearing surface that abuts the boss. As seen in Figure 2 of the '214 patent, the wear member does not contact the front face of the boss.

Independent claim 111 is directed to a boss, like claim 74, that includes an inner surface that is bent and adapted to be fixed along a face of the lip and the front of the digging edge. The inner surface of boss 29 in the '214 patent is fixed only along the face of the lip; it is not bent and fixed along the front of the digging edge as expressly recited in the claim. This claim further recites a forwardly facing bearing surface to abut the wear member and resist rearwardly directed forces. As

discussed above and seen in Figure 2 of the '214 patent, the front face of the boss 29 does not engage the wear member to resist the rearwardly directed forces.

Dependent claims 112 and 113 are allowable for the same reasons. Moreover, claim 112 recites that the forwardly facing bearing surface is arcuate and claim 113 recites that the front portion of the boss wraps around the digging edge to define a leg opposite the body of the boss. Neither of these additional features is disclosed in the '214 patent.

Independent claim 114 is directed to a boss that includes a rear structure adapted to mount along a first side of the lip and a front structure that is adapted to engage the front of the digging edge and the opposite side of the lip. In the '214 patent, as discussed above, the boss is spaced rearwardly of the front digging edge of the lip and does not engage the opposite side of the lip and the front of the digging edge. Hence, this claim is not met by the '214 patent.

Finally, all of the claims that have been rejected as anticipated by the '214 patent include one or more of the following features (as well as others in some cases):

1. a boss with an inner surface that is bent and extends along the face of the lip and the front of the digging edge;
2. a front portion of the boss that wraps around the digging edge of the lip;
3. a boss that includes a forwardly facing bearing face that abuts the wear member; and/or

4. a wear member with an opening for the lock that opens in the rear wall of the wear member.

As discussed above, none of these four features are disclosed in the '214 patent. Hence, applicants request withdrawal of this rejection and allowance of these claims.

Claims 88-90, 100-102, 104-106, 115-118 have been rejected under 35 U.S.C. 103(a) as being unpatentable over the '214 patent in view of U.S. Patent No. 4,433,496 to Jones et al. This rejection is respectfully requested.

First, claims 88-90 depend from claim 74, which recites a boss having an inner surface that is bent so that it is fixed along a face of the lip and the front of the digging edge. As discussed above, boss 29 in the '214 patent does not have an inner surface with this recited configuration. Further, the '496 patent does not include a boss at all. Hence, none of these claims are met by the combination of the '214 and '496 patents.

Similarly, claims 100-102 each depend from claim 91, which recites that the front structure of the boss wraps around the digging edge. As discussed above, the '214 patent does not in any way wrap around the digging edge. The '496 patent does not include a boss.

Claims 104-106 depend from claim 103, which recites that the front portion of the boss wraps around the digging edge and forms a forwardly-facing bearing surface. As noted above, the boss of the '214 patent does not wrap around the

digging edge or form a forwardly-facing bearing surface. The '496 patent does not include a boss.

Each of the claims 88-90, 100-102, 104-106 and 115-118 further recite that wear assembly includes a lock with first and second faces that oppose the bearing faces of the boss and the wear member to prevent release of the wear member from the lip. In these claims, the lock includes an adjustment assembly that moves or varies the first and second faces relative to each other to tighten the fit of the lock between the wear member and the boss.

The '214 patent discloses an assembly for securing a shroud to the digging edge of an excavator. The shroud fits over the digging edge and includes a pair of legs extending rearwardly along the inner and outer surfaces of the excavator. At least one of the legs is formed with a T-shaped slot that is slid rearwardly over a boss having a complementary shape. A rigid lock member is placed into an opening formed in the leg of the shroud so as to engage the rear surface of the boss and prevent removal of the shroud. The lock, however, is a solid block-like member. The faces resisting removal of the shroud are not moveable, and thus, do not adjust to eliminate looseness in the connection.

The '496 patent discloses a connection which is much different than the one in the '214 patent. More specifically, the '496 patent discloses an adapter which is secured to the lip of an excavator via a Whisler style mounting arrangement. In this construction, a through hole 14 is formed in the lip 10 and in both adapter legs 16, 16' to receive a C-shaped clamp member 26 and a wedge member 28. The

upper and lower arms of the clamp member 26 overlie the legs 16, 16' of the adapter. The inner surfaces of these arms diverge in a rearward direction and matingly engage corresponding surfaces on the legs 16, 16'. When the bolt 33 is tightened, the wedge member 28 presses the clamp member 26 rearwardly so that the arms press the legs of the adapter inward against the lip 10 so as to tightly hold the adapter in place.

Clearly, the assembly in the '496 patent is a much different structure and includes a locking arrangement which operates in a different manner than the lock in the '214 patent. First, the wear assembly in the '496 patent does not include a boss to interact and hold the adapter to the digging edge. Instead, the adapter overlies just the surfaces of the digging edge. Second, the type of lock envisioned in the '496 patent is inapposite to the tongue and groove arrangement in the '214 patent provided to hold the shroud in place. Third, the lock in the '496 patent does not set between complementary bearing faces on a boss (or other member) and the adapter to prevent removal of the adapter from the lip. Instead, the lock presses on a wall of the lip hole in order to force the arms of the clamp to inwardly press the legs against the lip. In view of the significant differences between the '214 patent and the '496 patent, one of ordinary skill in the art would not be taught to adjust the front and rear faces of the lock in the '214 patent to eliminate any looseness which may exist in mounting the shroud to the digging edge.

For all the above reasons, applicants submit that claims 74-118 are allowable along with claims 1-73.

Respectfully submitted,

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APPENDIX

The following claims are set forth to show the manner in which the claims have been amended in response to this Office Action. The new material has been underlined and the deleted material set in brackets.

74. (Amended) A wear assembly for an excavator having a lip with a digging edge, the wear assembly comprising:

a [mount] boss adapted to be fixed to an excavator lip, the [mount] boss including a front structure with an inner surface that is bent and fixed along a face of the lip and the front of the digging edge, a rear structure having a first shoulder that extends generally away from the digging edge, and a bearing surface;

a wear member including a second shoulder that engages the first shoulder to hold the wear member to the [mount] boss and prevent release of the wear member in a direction perpendicular to the extension of the front shoulder and an opening; and

a lock received into the opening in the wear member and in contact with the bearing surface of the [mount] boss to prevent disconnection of the first and second shoulders and thereby retain the wear member to the [mount] boss.

75. (Amended) A wear assembly in accordance with claim 74 in which the bearing surface of the mount generally faces rearward to engage the lock, and the [mount] boss further includes a front support surface that abuts the wear member to restrict rearward movement of the wear member.

77. (Amended) A wear assembly in accordance with claim 74 in which the [mount] boss is a one-piece member.

78. (Amended) A wear assembly in accordance with claim 74 in which the bearing surface of the [mount] boss is formed at a rear end of the body structure.

80. (Amended) A wear assembly in accordance with claim 79 in which the wear member has a generally T-shaped slot that includes the second shoulder, and the T-shaped coupling structure of the [mount] boss is received in the slot of the wear member.

81. (Amended) A wear assembly in accordance with claim 74 in which the rear structure of the wear member includes a rearwardly extending leg that substantially overlies the [mount] boss, and the front structure wraps around the digging edge to define a second leg.

88. (Amended) A wear assembly in accordance with claim 74 in which the lock includes a first face that abuts the bearing surface of the [mount] boss, a second face that abuts a wall of the opening in the wear member, and an adjustment assembly that [the] moves the first and second faces relative to each other to tighten the fit of the lock between the wear member and the [mount] boss.

91. (Amended) A wear assembly for an excavator having a lip with a digging edge, the wear assembly comprising:

a [mount] boss adapted to be fixed to an excavator lip, the [mount] boss including a coupling structure having holding surface in opposed relation to the lip

of the excavator, a bearing surface, and a front portion that wraps around the digging edge;

a wear member received over the [mount] boss and including retaining members that are received between the holding surfaces and the lip of the excavator to retain the wear member to the [mount] boss in directions other than a longitudinal direction, and an opening; and

a lock received into the opening in the wear member and in contact with the bearing surface of the [mount] boss to prevent disconnection of the first and second shoulders and thereby retain the wear member to the [mount] boss.

92. (Amended) A wear assembly in accordance with claim 91 in which the front portion of the [mount] boss further includes a front bearing surface that abuts the wear member to restrict movement of the wear member.

94. (Amended) A wear assembly in accordance with claim 91 in which the [mount] boss is a one-piece member.

100. (Amended) A wear assembly in accordance with claim 91 in which the lock includes a first face that abuts the bearing surface of the [mount] boss, a second face that abuts a wall of the opening in the wear member, and an adjustment assembly that moves the first and second faces relative to each other to tighten the fit of the lock between the wear member and the [mount] boss.

103. (Amended) A wear assembly for an excavator having a lip with a digging edge, the wear assembly comprising:

a one-piece boss adapted to be fixed to an excavator lip, the boss including a front portion that wraps around the digging edge and forms a forwardly-facing bearing surface, a coupling structure with first shoulders extending away from the digging edge, and a rearwardly-facing bearing surface;

a wear member received over the boss and including a [coupling] slot that engages with the coupling structure of the boss to permit only relative longitudinal movement between the wear member and the boss, an abutting surface to engage the forwardly-facing bearing face of the boss to limit rearward movement of the wear member relative to the boss, and an opening passing through the wear member; and

a lock received into the opening in the wear member and in contact with the rearwardly-facing bearing surface of the boss and a wall of the opening to prevent disconnection of the engaged slot and coupling structure.

114. (Amended) A [mount] boss for fixing to an excavator lip for mounting a wear member thereto, the [mount] boss including a rear structure adapted to mount along a first side of the lip, the rear structure including a coupling structure with shoulders extending rearwardly from the digging edge to engage complementary structure of a wear member and a rearwardly facing bearing face adapted to engage a lock holding the wear member to the [mount] boss, and a front structure adapted to engage an opposite side of the lip and the front of the digging edge, the front structure including at least one bearing surface adapted to

abut the wear member and resist unwanted movement of the wear member relative to the [mount] boss.

115. (Amended) A wear assembly for an excavator having a lip with a digging edge, the wear assembly comprising:

a [mount] boss adapted to be fixed to an excavator lip, the [mount] boss including a first shoulder spaced from the lip and a first bearing surface;

a wear member including a second shoulder that engages the first shoulder between the first shoulder and the lip to hold the wear member to the [mount] boss and prevent release of the wear member from the [mount] boss in a direction generally perpendicular to the lip, and an opening equipped with a second bearing surface, wherein the first and second bearing surfaces face in opposite directions when the first and second shoulders are engaged; and

a lock received into the opening in the wear member between the first and second bearing surfaces to prevent disconnection of the first and second shoulders from each other and thereby retain the wear member on the [mount] boss, the lock having a first lock surface to oppose the first bearing surface, a second lock surface to oppose the second bearing surface, and an adjustment assembly selectively movable to vary the relative positions of the first and second bearing surfaces to thereby apply forces to the wear member and the [mount] boss that tend to tighten the mounting of the wear member on the [mount] boss.

116. (Amended) A wear assembly in accordance with claim 115 wherein the [mount] boss includes a front structure that wraps around the digging edge of the lip.

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